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## How Can Supply Management Really Improve Performance? A Knowledge-Based Model of Alignment Capabilities

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### Abstract

Prior research has underscored the importance of internal and external supply chain integration, but the growing role of the supply management organization in developing this capability is not well specified. In this research, we explore the concept of supply management alignment, defined as the behavioral characteristics and process requirements for understanding and explicitly outlining internal stakeholder needs, and linking these to supplier performance agreements. Using the lens of dynamic capabilities, we propose a theoretical model for creating *supply management alignment*. This model presents the synergistic effects derived through strong internal lines of communication combined with external supply relationships based on defined metrics and processes. The underlying set of requirements to achieve supply management alignment is proposed and tested in this model, thereby enhancing our understanding of the processes and behaviors required for integration of internal stakeholder needs with external suppliers, which can lead to improved performance. We explore the complementary effects of supply management alignment on network agility and supplier performance improvements. Data from 151 UK manufacturing firms are used to test the model. The results provide a unifying framework tying together many of the prescriptive elements of strategic sourcing into a more coherent theoretical model and establish the basis for future studies of supply management alignment capabilities.

**Keywords:** *strategy; structure; alignment; capabilities; performance; supply management*

## INTRODUCTION

The literature on supply chain integration emphasizes the importance of enterprise alignment with suppliers (Cousins & Menguc, 2006c; Wong, Boon-itt, & Wong, 2011), but a major gap exists when it comes to the specific processes used to describe and communicate internal needs to those suppliers (Narasimhan & Das, 2001). Prior research suggests integration is hindered by functional disincentives but supported by improved internal alignment, procedural and information process quality (Oliva & Watson, 2011), and improved communication within the enterprise (Cousins & Menguc, 2006; Pagell, 2004). Cross-functional integration is believed to require specific incentives to be effective (Flynn, Huo, & Zao, 2010; Watson & Zheng, 2005). Much of the prior research has focused on internal relationships between manufacturing and marketing (Flynn et al., 2010; Malhotra & Sharma, 2002; O’Leary-Kelly & Flores, 2002). Narasimhan and Das (2001) do, however, identify the importance of purchasing integration on manufacturing performance but measure primarily outcome-based process measures. To some extent, the majority of internal integration research emphasizes cost savings achieved through strategic sourcing (Lawson, Cousins, Handfield, & Petersen, 2009; Terpend, Tyler, Krause, & Handfield, 2008).

A new face of procurement is emerging, which recognizes that a new set of value drivers must be developed in the face of massive environmental changes (Handfield, 2013). Prior work on dynamic capabilities emphasizes the need to “integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece, Pisano, & Shuen, 1997, p. 516). Dynamic capabilities are unique sets of routines and processes that build unique relationships and specialized knowledge within a firm (Eisenhardt & Martin, 2000; Peng, Verghase, Shah, & Schroeder, 2013; Teece et al., 1997). Such capabilities emerge through direct engagement with internal customers to understand requirements, codifying these requirements

into a coherent statement of need and effectively communicating them to the supply market (Narasimhan and Das, 2001; Pagell, 2004; Swink, Narasimhan, & Wong, 2007). We term this new capability ‘supply management alignment’ because it empowers procurement to link internal and external parties that are mutually dependent on one another. Supply managers play an important role in facilitating a match between internal stakeholder needs and the supplier’s interpretation of those needs. These strategies impact upon many value adding areas of the business, including the following: product innovation and technology development (Handfield, Ragatz, Monczka, & Petersen, 1999); knowledge sharing and new process capability development (Dyer & Nobeoka, 2000); multi-tier supplier integration (Choi, Wu, Ellram, & Koka, 2002); mitigation of supplier risk (Ellis, Shockley, and Henrey, 2011); supplier performance improvement and capability augmentation (Krause, Scannell, and Calantone, 2000; Krause, Handfield, & Tyler, 2007), supplier financial disruption avoidance (Wagner, Bode, & Kozmol, 2009); and sustainable supply chain improvements (Wieland & Handfield, 2013). Yet the specific processes resulting in improved alignment of internal stakeholder requirements with an emerging and growing global supply base remain unclear (Chen, Paulraj, & Lado, 2004; Handfield, 2013; Kotabe, Martin, & Domoto, 2003; Monczka et al., 2010).

Moreover, a gap in the extant research is the depiction of the specific processes employed by supply managers to learn about internal business needs, filter and codify this information into knowledge, and transfer (e.g., ‘align’) this codified knowledge effectively to suppliers. We, therefore, seek an answer to the research question: What are the characteristics of an effective supply management alignment process that result in improved outcomes? This study develops and tests a hypothesized model establishing an alignment process, drawing on both supply chain learning and knowledge management research (Hult, 2003; Hult, Ketchen, & Nichols, 2003, 2004). Learning in the context of supply management involves the “values and beliefs associated

with the development of new knowledge that has the potential to influence behavior” (Hult 2003, p. 192). As supply managers are being asked to play a more strategic role in developing supply chain capabilities, they are called on to generate and disseminate information (from internal stakeholders), develop a shared knowledge of the information (through internal category teams), and filter shared understandings into degrees of potential value (through supplier management systems), in order to store valuable wisdom within the organization (Azadegan, 2011; Cousins et al., 2006b; Huber, 1991; Hult, Ketchen, & Slater, 2004). This transformation of information into knowledge requires an intelligent process that operates through shared understanding and filtering of information (Hult et al., 2003), often through mechanisms such as key performance measures (Azadegan, 2011).

We begin with a brief review of the relevant theoretical underpinnings for this research, followed by the development of our specific research hypotheses. This is followed by a description of the empirical analysis, discussion of results, and conclusions for future research.

## **THEORETICAL MODEL**

The theoretical roots of our model lie in the extant research on dynamic capability theory, referring to the unique sets of routines and processes, unique relationships and special knowledge possessed by a firm (Eisenhardt & Martin, 2000; Peng, Schroeder, & Shaw, 2008; Teece et al., 1997). Dynamic capabilities are derived from exchanges of knowledge and relationships between supply chain partners (Barney, 2012; Peng et al., 2013; Priem & Swink, 2012). Recent literature reviews suggest that research is needed to understand the critical contingencies that define successful capability development between buyers and sellers (Azadegan, 2011; Crook & Esper, 2014; Zimmerman et al., 2014).

Studies of supplier integration have emphasized how strong relational partnerships between buyers and suppliers can improve suppliers' understanding of buyers' needs, the ability to meet changing requirements, and performance (Crook & Esper, 2014; Flynn et al., 2010; Zimmerman et al., 2014). Further, synergies are proposed when knowledge resources provide opportunities and boundary conditions in both customer and supplier facing relationships (Malhotra & Mackelprang, 2012; Peng et al., 2013). Other research points to the importance of internal integration and its positive impact on both delivery and flexibility performance (Azadegan, 2011; Schoenherr & Swink, 2013). These studies, while hinting at the presence of some form of internal-external alignment, do not explicitly define or articulate the supply management capabilities required to lead to these outcomes. Schoenherr and Swink (2012, p. 100) refer to "information processing capability" as an important component, but this is in reference to a firm's downstream external customers, not suppliers. Other research by Lawson et al. (2009) stresses the role of both formal and informal socialization as mechanisms for sharing information. The concept of *supply management alignment* in our study refers to the ability of procurement to formally define internal needs and ensure communication and understanding of these expectations by key suppliers. This is depicted as a "dynamic capability" consisting of organizational routines by which managers alter their resource base, which in this case, is the supply base (Eisenhardt & Martin, 2000; Peng et al., 2008).

We rely on prior theory on knowledge management defined as the "organized and systematic process of generating and disseminating information, and selecting, distilling, and deploying explicit and tacit knowledge to create unique value that can be used to achieve a competitive advantage in the marketplace by an organization" (Hult, 2003, p. 190). This definition forms the basis for our theoretical model, in that it is applied to the collection and dissemination of knowledge by purchasing between two specific entities: 1) internal stakeholders

and 2) suppliers. The knowledge-based view of the firm builds on tenets of the resource-based view's unique abilities to create and exploit wisdom-enhancing outcomes (Grant, 1996; Hult et al., 2004). When applied to our model of alignment of internal needs with external supply execution against these needs, knowledge management theory provides a suitable model for explaining the role of supply management alignment as an enabler and boundary spanner between stakeholders and suppliers (Hult, 2003). Supply management alignment is also linked to performance based on the idea of routines as organizational processes that utilize clusters of resources (suppliers) to achieve desired outcomes (performance improvement) (Teece et al., 1997).

### **Internal and External Alignment**

Our theoretical model is shown in Figure 1 and is introduced as follows. Alignment capability is driven by a routine initiated when (1) supply managers engage in knowledge acquisition to assess the needs of organizational stakeholders. Supply managers then apply this information (2) through strong process routines, (Hult et al., 2004; Peng et al., 2013), specifically using a well defined category strategy development process (Handfield, 2006). Category teams are able to (3) drive clear communication of these needs to suppliers through formal mechanisms (Azadegan, 2011), thereby driving supplier activity (4) that is consistent with stakeholder needs and long-term goals (Carr and Pearson, 2002). This dynamic capability is then posited to result in improved performance outcomes (Eisenhardt & Martin, 2000; Peng et al., 2008).

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While some authors argue that a highly centralized purchasing function is required to drive such improvements in performance outcomes (Chen et al., 2004; Lawson et al., 2009), others (Cousins & Menguc, 2006c; Hult, 1998) argue that it is the explicit process of knowledge

requirements for business that ensures the right goals are being pursued (Crook & Esper, 2014; Peng et al., 2013). We adopt the view that both components are needed to establish supply management alignment. Establishing a strong relationship with business unit stakeholders provides procurement executives the opportunity to establish supply management goals that are not only consistent with organizational goals, but also contribute directly to their success (Chen et al., 2004; Handfield, 2013). Secondly, supply managers at the category strategy level are able to communicate information between suppliers and stakeholders, thereby ensuring specific category strategies are aligned with stakeholder needs (Cousins et al., 2009; Lawson et al., 2009).

By understanding the true basis of competition and prioritizing what elements are important, supply management is able to establish a strong “team orientation,” whereby there is a commonality of purpose among all team members (Hult et al., 2003, p. 544). The key competitive and business priorities are often expressed through supplier performance specifications or statements of work. For example, a large construction equipment manufacturer uses the terminology QCLDM (Quality, Cost, Logistics, Delivery, Management) to codify both stakeholder and supplier requirements and operationalizes each one with lower bounds and clear expectations (Handfield, 2013). Performance against stakeholder-generated performance criteria is then measured using supplier evaluation programs, requests for quotes (RFQ’s), or requests for proposals (RFP) (Azadegan, 2011; Monczka, Handfield, Guinipero, & Patterson, 2014). This boundary-spanning activity involves both stakeholders and suppliers, clarifies expectations for all inter-firm relationships, and is a vehicle for the exchange and assimilation of knowledge within and between firms (Cousins & Menguc, 2006c; Dyer & Singh, 1998; Kale, Singh, & Perlmutter, 2000). The explicit nature of the knowledge acquisition and transmittal process is carried out by purchasing-led category management teams, who directly communicate the needs to suppliers in the form of an RFP, RFQ, or SOW, leading us to the following hypothesis:

**H1:** Internal stakeholder alignment is positively related to external supply base alignment.

### **Systems Orientation and Supplier Alignment**

Effective supply alignment necessitates a set of capabilities that may be unique to only a subset of organizations that have evolved procurement functions (Handfield, 2006, 2013). Organizations need to establish strategic resources in the form of capabilities that enable the engagement of internal stakeholders and creation of value (Wernerfelt, 1984). Learning is a complex concept encompassing both a *process* and a *structure* (Slater & Narver, 1998). The implication is that to be able to create strategic alignment, buying organizations must create mechanisms to guarantee that both internal stakeholders are able to *learn* the value of the new category management approach and *behave* accordingly (Hult, 2000). This is referred to in knowledge management research as a systems orientation, which requires prioritization of work, a deep understanding of stakeholder criteria, an ability to translate these needs into technical or performance requirements for suppliers, and a defined process clarifying to managers how these elements must be deployed (Hult et al., 2003; Monczka et al., 2014; Cousins et al., 2009).

The systems orientation concept was introduced by Hult (1998) and builds on the work of (Senge, 1990), and in our application measures alignment of procurement activities with the needs of individual business functions. Hult (2003, p. 544) defines systems orientation as “...the degree to which the corporate buying center and the SBU field manager in the focal sourcing unit stress the broad picture of activities in the strategic sourcing process, and is thus a reason certain activities exist.” Systems orientation is deemed an integral part of the organizational learning process because it helps to predict events, adjust processes, and facilitate the free flow of information from the environment.

Cooperative relationships between strategic buyers and suppliers require high levels of information exchange (Chen et al., 2004; Lawson et al., 2009) to facilitate the streamlining of



inter and intra-organizational processes, joint new product development, and cost reduction. Information exchange can apply both formal and informal socialization mechanisms (Cousins & Menguc, 2006) and is vital to the relationship process. It has been suggested that procurement should have deep knowledge of the business function, and in some cases may have prior experience in that same function but in a business or marketing role. For instance, one executive who participated in our study noted, "...in my experience the best advertising campaign category managers formally worked in marketing, and the best IT category managers used to work in IT."

The need for a structure and a process for internal alignment demands a different type of capability that concentrates on soft skills and a role as a trusted advisor to internal stakeholders. (Esper & Crook, 2014). A focus on internal stakeholder accountability defines procurement's role as a 'trusted advisor,' in so much as the procurement executive understands the elements of value critical to the business and the capability of the external supply market to deliver them. Procurement's true accountability is to build a strategy that resolves the need with an often broad and difficult set of market conditions.

Process (routines) and structure emerge as a critical component that enables internal and external knowledge transfers (Peng et al., 2008). Process occurs in a routine as purchasing first learns and then codifies business level needs into meaningful objectives (Eisenhardt & Martin, 2000; Lorenzoni & Lipparini, 1999). This entails the ability to articulate and create expressions of need using tools, such as statements of work, performance or technical specifications, or supplier evaluation programs (Azadegan, 2011). Much of this activity is determined through the category management process, which, when fully deployed, assures that a rigorous structure and process is communicated and carried out (Handfield, 2006). The clear interpretation and articulation of business needs guarantees a degree of alignment with organizational requirements; this becomes the basis for effective communication of needs to external suppliers (Kanter, 1994;

Lado, Boyd, & Hanlon, 1997). For example, if manufacturing is underscoring delivery and quality, yet purchasing continues to pursue cost savings to the exclusion of these requirements when negotiating with suppliers, suppliers will interpret this behavior as meaning that price is most important, while delivery can suffer—a potentially disastrous outcome. While having an effective internal communication process is certainly one piece of the puzzle, the second piece (structure) is articulated in the form of the buying organization’s capability to transfer knowledge to suppliers (Hult, 2003). This is most often referred to as a ‘system orientation,’ defined as the degree to which the members of the focal supply management unit stress the interconnectedness and mutual dependence of the activities in the supply management process (Hult et al., 2003). Knowledge acquisition activities shape information distribution to suppliers when team members clearly understand their role and objectives in the process (Hult et al., 2004).

**H2:** Purchasing process structure (systems orientation) is positively related to supply base alignment.

### **Complementary Effects on Supplier Alignment**

Prior research has shown that a relational approach to supplier collaboration can facilitate positive outcomes (Lawson et al., 2009). Progressive supply management functions acknowledge that value is created through forms other than simple cost savings, which has been the major form of procurement focus for many years (Fearon, 1968). Chief procurement officers now recognize that procurement’s unique placement as a boundary spanner in the organization creates the opportunity to establish inter-firm relationships as never before, leading to sustainable competitive advantages through knowledge flows between partner firms (Crook & Esper, 2014; Handfield, 2013). The ability of a firm to capture, transfer, and disseminate knowledge can create unique forms of competitive advantage (Grant, 1996), as relational contracts with partners

facilitate the flow of tacit knowledge not normally conveyed through conventional market mechanisms.

Consistent with the knowledge management view, our theoretical model proposes that supply management involves both a team orientation and a systems alignment (process structure). Learning occurs through the generation and dissemination of information in the form of stakeholder requirements, which are effectively translated via a strong routinized process capability (Peng et al., 2008). Both elements generate congruency outcomes. The combination of elements is often present in the form of category team leaders who engage stakeholders in a frank discourse on stakeholder needs, scans the external market, establishes a strategy for approaching the market, and builds relational contracts with suppliers (Handfield, 2006; Monczka et al., 2014). This approach is also consistent with the relational view of the firm, whereby investments made by buyers towards the development of key suppliers produce tangible benefits, such as cost reduction, improved quality, agility and joint product development (Dyer & Singh, 1998; Madhok & Tallman, 1998). As the category team leader builds a stronger relationship with the supplier, the relationship leads to increased information sharing, technical assistance, training, and aligned improvement efforts (Krause et al., 2007). In a sense, procurement takes on more of a role as both an internal consultant to the organization, and an external coach to the supplier (Handfield, 2013). Supply management alignment ensures that supply managers build a deep understanding of internal stakeholder requirements for success *before* establishing required performance criteria for suppliers (Handfield, Krause, Scannell, & Monczka, 2000; Krause et al., 2007).

Firms may have a strong process structure and systems orientation, but if the focus of these efforts do not match those of stakeholders, the right outcomes will not be achieved (Cousins, Lawson, & Squire, 2006b; Esper & Crook, 2014). This occurs in cases where

purchasing does not have ready access to the decision forums where critical supply chain requirements are made, such as product development and strategic planning meetings. Procurement also has little ability to influence product design decisions in such cases (Handfield et al., 1999). Similarly, firms may have strong internal ties to the business, but lack the systems and capabilities to codify these needs into a set of relationships that are meaningful to suppliers. Sourcing and category team leaders who possess both a team and systems orientation have a much higher likelihood of successfully learning, interpreting, and communicating business needs to the supply base. This combination of internal alignment and purchasing process structure is proposed to have an interaction effect with external alignment:

**H3:** The interaction of internal stakeholder alignment and purchasing process structure has a positive effect on supply base alignment.

### **Aligned Suppliers are More Agile**

By and large, the major outcome of ‘strategic purchasing’ has been focused on cost savings performance (Chen et al., 2004). Several other researchers have documented how improved collaboration between buyers and sellers can lead to the development of new technologies or products (Petersen, Handfield, & Ragatz, 2005), shared process and technical knowledge that produces tangible improvements (Dyer and Nobeoka (2000), improved supplier quality and delivery (Lawson et al., 2009), and can foster long-term and sustainable impacts on partner performance (Cousins et al., 2006a). In the words of one study participant, “...the majority of benefits accrue after the ink on the contract has dried, not through contracted savings, but through shared continuous improvement.”

In the current global environment, the ability of suppliers to quickly adapt and change in response to the evolving needs of customers has been documented as paramount for performance (Handfield, 2013). According to a recent survey of 1,700 supply chain executives in North

America, Europe, Brazil, China, Russia, and the Middle East, the number one top logistics objective was ‘meeting customer expectations,’ followed by ‘on-time delivery.’ A majority of managers believe that customers can change delivery orders based on 10 days or less, and over 50% indicated that this window could be one day or less (Handfield et al., 2013). To achieve this ability to rapidly respond to changes in delivery and schedule volume, and to accept late mix changes, organizations have taken steps to invest in visibility systems, work with suppliers to improve communication, and have designed products with more modular product structures that enable quicker configuration to customer orders. Conversely, Chinese managers who were interviewed as part of our study emphasized how agile decision-making was especially problematic in their organizations, as procurement was often highly centralized, with poor alignment between stakeholders, procurement, and suppliers (Handfield et al., 2013). This cultural attribute is difficult to overcome given China’s roots in centralized planning. Results suggest that in a complex global supply chain network, network agility is even more important than low cost and requires a close working relationship, established performance priorities, and open lines of communication between buying companies and their suppliers. We posit a direct relationship between increased supplier alignment and network responsiveness (Flynn et al., 2010; Schoenherr & Swing, 2012).

**H4:** Supply base alignment is positively related to supplier agility.

### **Agility and Alignment Improves Supplier Performance**

As organizations move towards customer-driven network environments, the coordination of decisions throughout the chain becomes paramount for success (Holweg & Pil, 2008). Complex adaptive systems research suggests that adaptive, flexible, and coherent collective behavior in supply chains is an imperative (Choi et al., 2002, p. 352). This body of research is

clear in depicting supply chain coordination as involving a meaningful level of knowledge transfer and learning within the context of buyer-seller interactions. A systems orientation within supply management ensures that input derived from stakeholders is properly coded and communicated to suppliers, enabling improved responsiveness to these requirements. In some cases, they are also able to learn to predict buyer requirements before they are communicated. Bundles of skills and accumulated knowledge enable both firms to coordinate activities more effectively, creating both marketing-related and technology-related capabilities (Day, 1994). This in turn leads to benefits that go beyond simple cost savings, but translate instead into formal performance benefits including improved product outcomes, process outcomes, and increased innovation (Terpend et al., 2008).

**H5:** Supply base alignment has a direct and positive effect on buyer performance improvement.

Secondly, we propose that heightened responsiveness in the supply base fosters knowledge and learning over time (Lawson et al., 2009). With this improved knowledge of customer requirements, suppliers learn to provide suggestions for improvement and approach the buyer with ideas for product, process, and product quality improvements (Dyer & Nobeoka, 2000; Krause et al., 2000, 2007). Learning also takes place on the part of buyers who are open to supplier ideas and establish supplier suggestion programs through formal and informal channels of communication (Cousins et al., 2006a). Hence, our final hypothesis (H6) posits that:

**H6:** Supplier agility has a positive effect on the level of performance improvement.

In the following section, we describe the research methods employed to test these hypotheses.

## **RESEARCH METHODS**

### **Sample Characteristics**

The hypotheses were tested through a survey that collected information about a firm's strategic supply practices. A sample of 800 United Kingdom manufacturing firms was surveyed, which included firms from a database provided by the Chartered Institute of Purchasing & Supply (CIPS). Each respondent in the sample was selected based on job function (purchasing manager or equivalent), plant size (at least 100 employees), and industry sector by SIC code. We received 172 responses, of which 21 were deemed unusable due to missing data. The effective response rate was thus 18.8% (151/800). This response rate compares favorably with other similar studies in the area (Carr & Pearson, 2002; Ragatz, Handfield, & Petersen, 2002; Rosenzweig, Roth, & Dean, 2003).

The characteristics of the sample organizations are shown in Appendix A, including the number of employees, business unit sales and industry sector. The response by position was managing director (3%), vice president/director (13%), purchasing manager (52%), senior buyer (8%), and junior manager (24%). No significant mean differences were detected between any pair of these groups. The average length of tenure with the company was 10.16 years, providing support that our informants were also knowledgeable about the issues under investigation. An important characteristic of systems and team orientation culture is that managers throughout the enterprise understand and buy in to the concept (Hult et al., 2003). As such, we sought a broad sample of respondent levels.

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### **Questionnaire Administration**

The survey and a letter explaining the purpose of the research was mailed to senior purchasing managers. Efforts were made to enhance the response rate by sending an email containing the

survey to managers two weeks after the initial mailing and by offering respondents a composite summary of results (Forza, 2002). The survey was also pretested in two phases. The draft questionnaire was first sent to four academics, experts in the area, and four practitioners who were asked to comment on the content, clarity, and scaling of the instruments. A small number of minor changes were made as a result of this feedback.

In completing our research, we also conducted eight 30-minute phone interviews with supply management executives from a variety of different industries (oil and gas, electronics, medical devices, transportation and logistics, supply chain consulting, and others). These interviews explored many of the relationships posited in the survey and elicited several important insights that were woven into the analysis and discussion later in the paper.

### **Non-Response Bias**

Tests for non-response bias were carried out by comparing early respondents (responses received within the first two weeks) and later respondents (responses received within the third week or later) (Armstrong & Overton, 1977). A *t*-test of difference was conducted on firm size (employees and sales), and mean responses to each variable. No statistically significant differences were identified at  $p < .05$ .

### **Operationalization of Variables**

The items used to measure the theoretical constructs were derived from an extensive review of the extant literature. Each item was measured using a seven-point Likert scale, with the use of practices anchored at “not at all” (=1) and “a very great extent” (=7). All items used in the questionnaire are reported in the Appendix.

***Internal Stakeholder Alignment.*** We used the construct developed by Chen, Paulraj, and Lado (2004), which assessed the extent to which purchasing professionals’ development focuses on the elements of the competitive strategy, the purchasing function has a good knowledge of the firm’s



strategic goals, purchasing performance is measured in terms of its contribution to the firm's success, and purchasing is included in the firm's strategic planning process. These measures align the team orientation construct developed by Hult (1998), which evaluates cross-functional team work, commonality of purpose in purchasing, agreement on organization vision, and sharing of vision.

***Systems Orientation*** This construct was measured using a four-item scale developed by Hult (1998). Respondents were asked to assess their understanding of how their activities fit within the purchasing process value chain, and how well defined these activities are.

***Supply Base Alignment*** This construct was adapted from Krause, Scannell, and Calantone (2000). Respondents were asked the extent to which the organization measured the following: supplier performance through formal evaluation, using established guidelines and procedures; made use of a supplier certification program to verify supplier quality, thus making incoming inspection unnecessary; site visits by your firm to the supplier's premises to help it improve its performance; invited the supplier's personnel to your site to increase their awareness of how their product is used; and training/education of the supplier's personnel.

***Supplier Agility*** This construct was measured using a four-item scale developed by Lawson, Cousins, Petersen, and Handfield (2009) gauging the responsiveness of a firm's suppliers, including their ability to undertake customization, responsiveness to schedule and volume changes, and degree of modularization leading to improved flexibility.

***Performance Improvement*** This construct was evaluated using a three-item scale, adapted from Kotabe, Martin, and Domoto (2003), assessing the degree to which the relationship had, over the past two to three years, resulted in improved product design, product quality, and reduced lead times for the buyer firm.

## RESULTS

Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were adopted to test our proposed theoretical framework. AMOS 7.0 was employed for this purpose (Arbuckle, 2006). We assessed model fit using four indices: the chi-square test, the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root-mean-square error of approximation index (RMSEA). Discussion of these indices may be found in Gerbing and Anderson (1992), Hu and Bentler (1999), and Marsh, Balla, and Hau (1996). Satisfactory model fits are indicated by non-significant  $\chi^2$  tests, RMSEA values less than or equal to .08, and TLI and CFI values greater than or equal to .90.

The items were first validated via CFA, which provides a more stringent test of construct validity and unidimensionality using latent and manifest variables. Each construct was made scale-variant by fixing one of the loadings in each construct to a value of 1.0 (Jöreskog & Sörbom, 1993). Each indicator within the measurement model was then checked for low factor loadings (<.40), high residuals (i.e., normalized residuals > 2.58), and modification indices (>3.84). Appendix A provides the loadings and error terms of the manifest variables onto each latent variable.

A number of procedures were followed to assess convergent validity (Bagozzi & Yi, 1988) and discriminant validity (Anderson & Gerbing, 1988; Fornell & Larcker, 1981). The convergent validity of the scales (the extent to which the measurement items reflect a common underlying construct) was supported, with estimated coefficients of all indicators being significant ( $t > 2.0$ ). The average variance extracted (AVE), which measures the variance captured by the indicators relative to measurement error, was also greater than the 0.50 minimum necessary to justify the use of a construct (Hair, Anderson, Tatham, & Black, 1998). The exception was the AVE for supply base alignment of .49, slightly less than the recommended

cutoff. Since all other AVE and CR results exceed the minimum levels, we consider the overall validity of the model to be acceptable. Composite reliability values were also calculated to provide a further assessment of internal consistency. A minimum value of 0.70 is recommended, as it indicates that around 0.50 of the item's variance (the squared loading) can be attributed to the construct of interest (Fornell & Larcker, 1981). The lowest composite reliability was .81 for strategic purchasing, ranging to .91 for systems orientation.

All tests of discriminant validity were similarly supportive. That is, no confidence intervals of the correlations for the constructs ( $\phi$  values) included 1.0 ( $p < .05$ ) (Anderson & Gerbing, 1988), and the square of the intercorrelations between two constructs,  $\phi^2$ , was less than the AVE estimates of the two constructs. This was true for all pairs of constructs (Fornell & Larcker, 1981). The inter-item correlations, composite reliabilities (CR), and the values of AVE for the constructs operationalized in this study are shown in Table 2. We also carried out a test of convergent validity by correlating the buyer performance improvement construct with a self-reported objective scale of firm profit margins. The financial performance construct was correlated positively and significantly with profit margin ( $r = .44, p \leq 0.01$ ).

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Finally, the overall fit of the CFA measurement model to the data was satisfactory: [ $\chi^2(179) = 286.05, p = .00$ ; TLI = .93; CFI = .94; and RMSEA = .063].

The structural model was tested with full information maximum likelihood estimation. The model (Figure 2) is recursive and hence identified (Bollen, 1989). The fit indices for the structural model indicate an acceptable fit to the data: [ $\chi^2(201) = 309.05, p = .00$ ; TLI = .93; CFI = .94; RMSEA = .060]. Further, the interaction effects between strategic purchasing and systems

orientation were computed as product terms. The lambdas that represent the reflection of each of these interaction terms on its latent construct, and their associated error terms were calculated using the approach described by Ping (1995).

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Figure 2 presents the results of the six hypothesized relationships and shows that the constructs are related in the theoretically predicted manner. Hypothesis 1 and 2, respectively, were supported, with internal stakeholder alignment ( $\beta = 0.30, p < .01$ ) and purchasing process structure ( $\beta = 0.38, p < .001$ ) significantly associated with supply base alignment. We also found a positive moderating effect between the interaction effect (Internal Stakeholder Alignment X Purchasing Process Structure) and supply base alignment ( $\beta = 0.27, p < .001$ ). In turn, supply base alignment was significantly related to network agility ( $\beta = 0.41, p < 0.001$ ) and performance improvement ( $\beta = 0.65, p < .001$ ), supporting Hypotheses 4 and 5, respectively. Finally, network agility was positively associated with performance improvement ( $\beta = 0.24, p < 0.001$ ), providing support for H6.

In the next section, we discuss the implications of these results.

## DISCUSSION

Our research set out to answer the question: “What are the characteristics of an effective supply management alignment process that results in improved outcomes?”. We next discuss the characteristics that are critical to alignment identified by our research project and go on to draw implications for theory and practice. As noted by one of the executives we interviewed:

“...The space occupied by procurement is not well understood by the CEO or the CFO in most companies, and in many cases is not well understood by the CPO themselves! There is a huge opportunity as organizations roll out category strategies, as these have a huge

impact on the top line and the bottom line of the company. We need to back away from the standard portfolio matrix approach, and recognize the importance and magnitude of the risk that needs to be documented in the supply chain. Procurement is the only platform in the company that has an end-to-end horizontal view of the supply chain. Marketing and IT see this to some extent, but not like procurement. Procurement must take this opportunity to exercise leadership and truly position procurement as a strategic contributor at the executive board level on organizational decisions. This means bringing the right level of ambition to the table.”

This statement provides a good jumping off point to discuss the implications of the results identified in this study and their contribution to our thinking. All of the hypothesized results were positive and significant, providing support for our supposition that procurement transformation requires both internal and external relationship management capabilities (Handfield, 2013). The research suggests a number of different implications that provide guidelines for on-going research in supply management.

First, the identification and development of ‘supply management alignment’ as a dynamic capability augments prior studies that found inbound supplier flexibility could complement outbound logistics flexibility (Malhotra & Mackelprang, 2012). Delivery performance is certainly one form of value, but our research extends this concept and identifies the specific forms of procurement behaviors and capabilities required to achieve this alignment. Other studies propose that synergies exist when improved integration occurs across customers and suppliers, but specific guidelines as it relates to procurement are not well understood (Schoenherr & Swink, 2013). Our results point to the importance of common goals, aligned metrics, and defined processes that occur in parallel between purchasing and stakeholders, purchasing and suppliers, and the combined synergistic effect of these performance measurement systems on network agility performance.

Our research has important implications for how procurement should organize itself to facilitate the right level of internal and external alignment. The most common form of structure

is through an approach identified as category management (Monczka et al., 2014). Traditional category management approaches have been largely focused on internal spending patterns and have targeted high spend areas for cost savings based on driving common specifications, part families, or services. However, category management may not be the only way to think about how to organize procurement effort. The strength of supplier relationships clearly demonstrates how both elements of internal and process structure are important.

An alternate emerging approach is to organize around internal categories based on bilateral characteristics defined on the one hand by the needs of constituent internal stakeholders, but secondarily by the characteristics of the external supply marketplace. This is first and foremost a technological hierarchy defined on product or service specifications, but mature organizations are not limited to just internally defined criteria (Handfield, 2013). Advanced category management structures assign category roles that provide the most logical and simple interface between the external and internal worlds that the category manager must communicate between and connect. We discovered several variations of this approach. First, a category manager may be assigned to a large supplier that provides multiple products and services to multiple businesses and functions within the buying organization. Second, they may be assigned to an emerging technology group geared towards tracking innovations that can align with the internal technology product roadmaps. Third, they might be relegated to a largely external role as a cost analyst, understanding the movement of key metals, commodities, and chemicals in supply markets, and translating and codifying this knowledge into specific impacts. Fourth, they may serve as a government interface to influence legal standards, tariffs, or environmental regulations that can dramatically influence the course of procurement. We are, thus, much more likely to see a diversity of different forms of sourcing executive roles in the future that are less aligned around

category, but are focused on creating greater alignment between the internal and external environments they face.

## **LIMITATIONS AND CONCLUSIONS**

No research is without its limitations, and there are some cautions in interpreting the results of our study. First, this study was based on a sample of companies in the CIPS database. Although a wide range of sectors was evident, the results may not be generalizable to all companies. Replication across other industries, including services, as well as international contexts would also increase our understanding of the pervasiveness of strategic purchasing. Informant bias can be an issue in self-reporting surveys (Kumar, Stern, & Anderson, 1993). We attempted to minimize the presence of any such bias through the selection of respondents with comparable roles, focusing on organizational and sub unit performance and avoiding questions of personal performance, as well as by assuring total anonymity and confidentiality such that individual responses could not be identified. In addition, the cross-sectional nature of our data means that we are not able to test causal inferences regarding the relationship between strategic purchasing, supplier development, and the outcomes on supply base agility and buyer performance improvement. Longitudinal data are required in order to assert causation. Future research based on case studies could provide rich data and would be particularly useful in substantiating the interaction effect of what we have termed ‘supply management alignment’ in the supplier development process.

Our unit of analysis was also restricted to one side of a dyadic tie between the buyer and supplier. Further research could examine the other side of the dyad, namely the supplier. Future research could also go on to develop the financial implications of supply management alignment for both the buyer and supplier firms. We suspect that supply management alignment has a

synergistic effect for both the buyer and the supplier. It would be interesting to investigate this as a motivation for buyers and suppliers to become involved in supplier development activities.

Prior research on purchasing and supply management has largely assumed that sourcing activities occur in a vacuum and are vague in establishing the mechanisms for this alignment. There is also a need to explore the relative value of internal and external management, as managers often perceive that their companies are more accomplished in external integration efforts than they are in internal efforts. Our approach draws on the systems orientation developed by Hult et al. (2003), which identifies the importance of a systematic and team-based approach to carrying out congruency requirements and the importance of establishing both a deep knowledge of stakeholder requirements as well as a direct channel for communication of these needs to suppliers. Our research emphasizes the importance of employing congruent and aligned performance metrics between internal and external parties. Most importantly, the *combination* of these activities can create a distinctive competence and a synergistic effect. The synergistic benefits gained from these management processes are difficult to imitate and substitute, and they clearly add value; therefore, they conform to the tests of a strategic capability (Gulati et al., 2000).

While readily identifiable as important, this ability to bridge stakeholders and suppliers is in fact a challenge for many organizations with which we spoke. For example, several procurement executives noted that they had difficulty getting internal stakeholders to see purchasing as anything other than a ‘cost-cutter’ or ‘hardball negotiator.’ In fact, several organizations are taking steps to promote procurement as a more strategic function and have compared this evolution to the evolutionary path of the marketing area. This ability to act as a boundary spanning function between internal and external organizational stakeholders has its roots in the marketing research, and is referenced in this research as “supply management



alignment”. Prior to the 1980s, marketing was viewed as a mere sales order taking activity and has grown to be recognized as a critical function that links customer needs with internal business planning (Song et al., 2005; Slater & Narver, 1998). A similar strategic transformation is underway in procurement, as the same set of alignment capabilities required for effective marketing is also necessary for stakeholder-supplier communication. Both marketing and procurement talent pools can learn skills from one another as they develop applications in each of their respective areas. The merging of buy-side and sell-side capabilities was adopted by the International Association of Commercial and Contract Management (IACCM) and provides a natural basis for integration. Indeed several of the executives we spoke with explained the approach they used to create the right type of ‘blended skills’ needed to drive better internal alignment of procurement with the functional roles in the organization.

Our research also went on to investigate the impact of improved supply management alignment on firm performance improvement. One of the key structural effects that arise from improved alignment is that the supply base becomes more agile and able to respond rapidly to customer requirements due to improved understanding of these requirements. Increased levels of internal alignment facilitate the exchange and flow of knowledge between supply managers and supplier firms (Krause et al., 2007; Kotabe et al., 2003). Procedures, market knowledge, and new product development activities all improve (Lawson et al., 2009; Cousins et al., 2006a), resulting in a new and dynamic capability (Teece et al., 1997; Eisenhardt & Martin, 2000). To the end, this improved knowledge of requirements drives higher levels of supplier performance improvements that directly benefit all parties in the supply chain.

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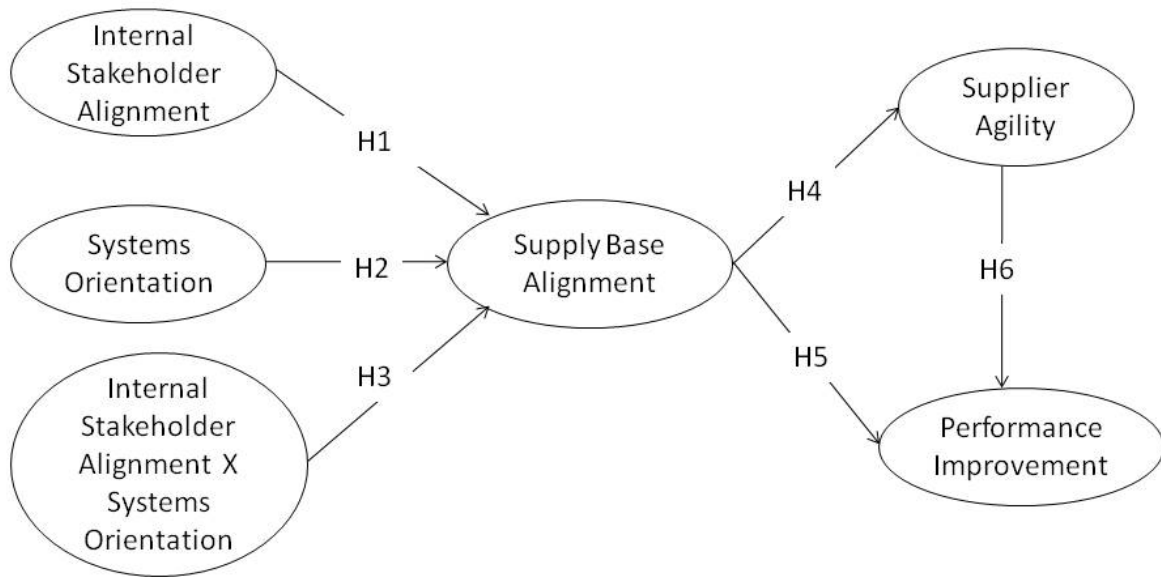
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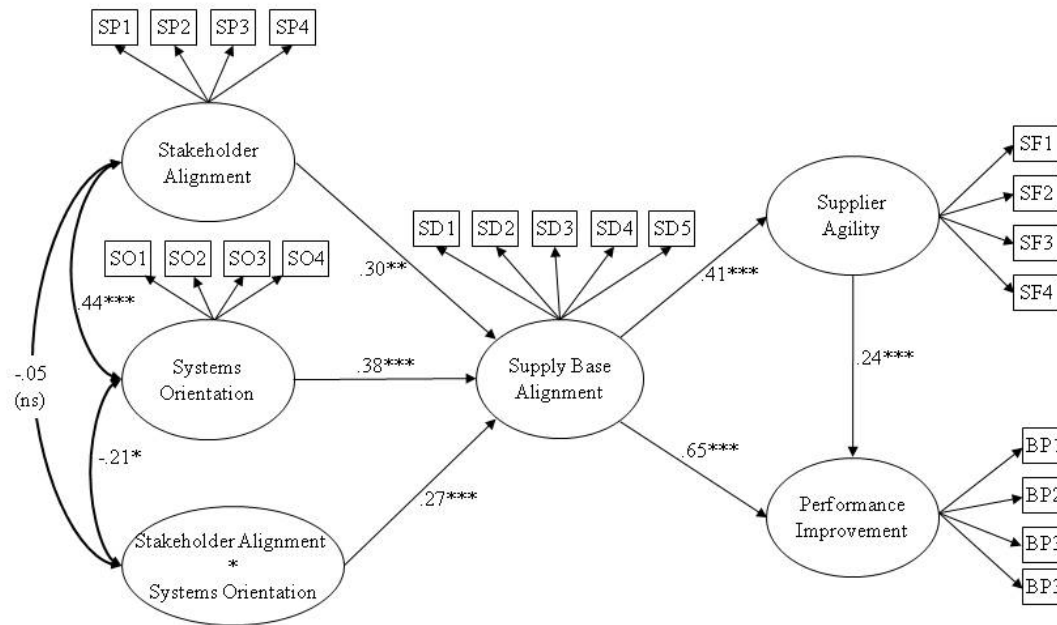
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**FIGURE 1**  
**Theoretical Model**



**FIGURE 2**  
**SEM Results**



\*  $p < 0.05$  \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , all one-tailed tests

**TABLE 1**  
**Profile of Respondents**

	<i>N</i>	%
<i>Number of employees</i>		
Under 100	26	17.2
100–500	42	27.8
500–1000	10	6.6
1,000	61	40.4
No response	12	8.0
Total	151	100.0
<i>Business unit sales volume</i>		
Under £50 million	38	25.2
£50 million–100 million	22	14.6
£100 million–250 million	16	10.6
£250 million–500 million	15	9.9
£500 million–£1 billion	18	11.9
£1 billion	35	23.2
No response	7	4.6
Total	151	100.0
<i>Industry Sector</i>		
Aerospace and defense	10	6.6
Automotive	10	6.6
Chemicals	6	4.0
Communications / high tech	15	9.9
Consumer goods	12	7.9
General manufacturing	33	21.9
Pharmaceutical	7	4.6
Other services	57	37.7
No response	1	0.7
Total	151	100.0



**TABLE 2**  
**Correlation Matrix and Descriptive Statistics**

<b>Variable <sup>a</sup></b>	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>	<b>5.</b>
<b>1.</b> Performance Improvement	<b>1.00</b>				
<b>2.</b> Supplier Agility	.50	<b>1.00</b>			
<b>3.</b> Supply Base Alignment	.74	.44	<b>1.00</b>		
<b>4.</b> Internal Stakeholder Alignment	.41	.13	.40	<b>1.00</b>	
<b>5.</b> Systems Orientation	.38	.25	.44	.44	<b>1.00</b>
Mean	4.39	4.59	4.30	4.24	5.00
Standard deviation	1.18	.92	1.24	1.16	1.10
Average Variance Extracted	.65	.61	.49	.52	.71
Composite Reliability	.88	.86	.82	.81	.91

<sup>a</sup> For  $N=151$ ,  $r$  has to be 0.161 or higher to be significant ( $p<0.05$ )

## APPENDIX A

### Constructs and Items

Each item was measured using a seven-point Likert scale, with the use of practices anchored at “not at all” (=1) and “a very great extent” (=7).

#### Internal Stakeholder Alignment

*How well do you agree with the following about purchasing within your firm?*

SP1: Purchasing professionals’ development focuses on the elements of the competitive strategy ( $\lambda=.74$ ,  $\varepsilon=.17$ ,  $t=7.51$ )

SP2: The purchasing function has a good knowledge of the firm’s strategic goals ( $\lambda=.77$ ,  $\varepsilon=.99$ ,  $t=7.28$ )

SP3: Purchasing performance is measured in terms of its contribution to the firm’s success ( $\lambda=.68$ ,  $\varepsilon=.15$ ,  $t=6.82$ )

SP4: Purchasing is included in the firm’s strategic planning process ( $\lambda=.67$ )

#### Systems Orientation

*How well do you agree with the following about the purchasing process within your firm?*

SS1: All activities that take place in the purchasing process are clearly defined ( $\lambda=.73$ )

SS2: We understand how our work fits into the value chain of the purchasing process ( $\lambda=.82$ ,  $\varepsilon=.09$ ,  $t=10.06$ )

SS3: We have a good sense of the interconnectedness of all parts of the purchasing process ( $\lambda=.93$ ,  $\varepsilon=.10$ ,  $t=11.28$ )

SS4: We understand where all activities fit in the purchasing process ( $\lambda=.87$ ,  $\varepsilon=.10$ ,  $t=10.67$ )

#### Supplier Agility

*To what extent do the following describe characteristics of your key suppliers?*

SBF1: Responsiveness to our schedule delivery changes without excessive cost penalties ( $\lambda=.93$ )

SBF2: Responsiveness to our schedule volume changes without excessive cost penalties ( $\lambda=.94$ ,  $\varepsilon=.06$ ,  $t=17.08$ )

SBF3: Ability to accept late ‘mix’ changes in orders ( $\lambda=.66$ ,  $\varepsilon=.08$ ,  $t=9.69$ )

SBF4: Modularisation of supplier products ( $\lambda=.52$ ,  $\varepsilon=.07$ ,  $t=6.96$ )

#### Supply Base Alignment

*To what extent does purchasing carry out the following with its key suppliers?*

SD1: Assessment of supplier’s performance through formal evaluation, using established guidelines & procedures ( $\lambda=.74$ )

SD2: Use of a supplier certification program to certify supplier’s quality, thus making incoming inspection unnecessary ( $\lambda=.64$ ,  $\varepsilon=.14$ ,  $t=7.38$ )

SD3: Site visits by your firm to supplier’s premises to help supplier improve its performance ( $\lambda=.78$ ,  $\varepsilon=.11$ ,  $t=8.92$ )

SD4: Inviting supplier’s personnel to your site to increase its awareness of how its product is used ( $\lambda=.69$ ,  $\varepsilon=.10$ ,  $t=7.93$ )

SD5: Training/education of the supplier’s personnel ( $\lambda=.62$ ,  $\varepsilon=.12$ ,  $t=7.08$ )

**Performance Improvement**

*How well do you agree with the following about the performance from your key suppliers in the last two years?*

BPI1: Improved product design performance ( $\lambda=.84$ ,  $\varepsilon=.13$ ,  $t=9.56$ )

BPI2: Improved process design ( $\lambda=.86$ ,  $\varepsilon=.12$ ,  $t=9.67$ )

BPI3: Improved product quality ( $\lambda=.80$ ,  $\varepsilon=.12$ ,  $t=9.14$ )

BPI4: Reduced lead time ( $\lambda=.71$ )